

# HOW TO PREPARE FOR THE LEVEL A CRANESAFE CERTIFICATION ASSESSMENT

1 November 2013

## Assess Yourself First

Prepare for your assessment! Our website contains all the information you need for a successful assessment. Our goal is to find you competent on the assessment. We want you to be as prepared as possible for the assessment so that your chances of success are greatest.

In our experience the part of the assessment people find most challenging is the load chart and rigging calculation exercises. Use these practise exercises to help you get ready for the assessment. [www.fulford.ca/crane/cs\\_pex.html](http://www.fulford.ca/crane/cs_pex.html)

Learn more about the core skills & knowledge for all crane types as well as competency guides for each type of crane that give you more background on the competencies we are assessing against. [www.fulford.ca/crane/crane\\_comp.html](http://www.fulford.ca/crane/crane_comp.html)

Please use this information to get yourself ready for a successful assessment.

## What does the Assessment Include

The assessment has three main parts and is designed to allow you to demonstrate your skill and knowledge of safe craning.

The assessment takes between 2 – 2½ hours (3 – 3½ hours for Lattice Friction Cranes).

Results will be mailed to you within one week and, if found competent, you will receive your certificate.

- Part 1**     **Hand Signals**
- Part 2**     **Load Chart & Rigging**
- Part 3**     **On-Crane Practical Assessment**
  - A. Pre-Operational
  - B. Crane Set Up & Hazard Assessment
  - C. Crane Operation

## On-line Resources

Go to our website for more details and practice exercises.

**What's Included in the Assessment**  
[www.fulford.ca/crane/crane\\_asst.html](http://www.fulford.ca/crane/crane_asst.html)

**Load Chart & Rigging Practice Exercises**  
[www.fulford.ca/crane/cs\\_pex.html](http://www.fulford.ca/crane/cs_pex.html)

**Core Skills & Knowledge**  
[www.fulford.ca/crane/crane\\_comp.html](http://www.fulford.ca/crane/crane_comp.html)

**Log Book**  
[www.fulford.ca/crane/cs\\_pex.html](http://www.fulford.ca/crane/cs_pex.html)

**Hand Signals**  
[www.fulford.ca/crane/cs\\_links.html](http://www.fulford.ca/crane/cs_links.html)

**Tower Crane Handbook**  
[www.fulford.ca/crane/cs\\_links.html](http://www.fulford.ca/crane/cs_links.html)

**Assessment Location & Fees**  
[www.fulford.ca/crane/crane\\_assessdetails.html](http://www.fulford.ca/crane/crane_assessdetails.html)

*If you are unable to access our website, please call our office and we will make other arrangements for you.*

## Employers

If you are an employer, please ensure that your crane operators are aware of what the assessment involves and have had the opportunity to review the practice exercises prior to their assessment.

### Times to Complete the Level A Assessment

Assessment appointments typically require a total of 2 to 2½ hours of operator and machine time (between 3 and 3½ hours for Lattice Friction Crane). Operators must complete the load chart and rigging calculations section and the on-crane practical section within the following time limits:

Crane Type	Load Chart & Rigging Calculations	On-Crane Practical (With + Without Load)
Lattice Friction	90 minutes	15 + 15 (total 30 mins)
Hydraulic Friction	90 minutes	15 + 15 (total 30 mins)
Mobile Hydraulic	60 minutes	15 + 15 (total 30 mins)
Stiff Boom Truck	60 minutes	15 + 15 (total 30 mins)
Folding Boom Truck	45 minutes	10 + 10 (total 20 mins)
Tower	n/a	10 minutes
Self Erect Tower	45 minutes	20 minutes

### Crane & Site Requirements

Please ensure that the crane being used for the assessment is out of storage and ready to be used when the Assessor arrives.

#### Crane must possess valid certification

The crane must have a valid inspection certificate. Failure to provide a valid certificate will result in the Assessor automatically terminating the Practical Portion of the Assessment. Additionally, if the assessor feels the crane is unsafe due to mechanical, electrical or hydraulic faults (which are not covered under Structural Certification inspection) the assessor will terminate the assessment. In either of these cases, the assessment fee will not be refunded and the cancellation policy applies.

#### Crane must be equipped with a log book

Occupational Health and Safety Regulations require all cranes to be equipped with an equipment log book. A sample log book is posted on our website: [www.fulford.ca/crane/cs\\_logbook.doc](http://www.fulford.ca/crane/cs_logbook.doc).

#### Load for assessment required on site

The Assessor will require a Load to be used with an approximate weight of 300 to 500 pounds, ideally with an engineered lift point (e.g. on a lock block, a cast in lifting bar versus a wire rope stranded loop).

#### Location for the load chart and rigging calculations

This portion of the assessment requires a room where the operator can sit undisturbed to work through load chart and rigging calculation exercises. A lunch room or equivalent is fine so long as the operator will not be disturbed there; otherwise an office is a better choice. We provide all materials necessary for this portion of the assessment.

#### Location of on-crane assessment

The location for the on-crane assessment must be free of obstructions and should allow the crane to extend at least 75% of its maximum boom length in the case of hydraulic powered booms. Lattice Booms must have a minimum of 100 feet of boom rigged. Mobile Hydraulic Cranes and Boom Trucks must use a minimum of ¾ of the powered sections of the main boom.

### Operator Requirements & Hand-Outs

To ensure the best chance of successfully completing the CraneSafe Level A assessment, crane operators need to be aware of what will take place during their assessment.

In particular, it is important to note that one section of the assessment is comprised of written calculations using load charts and rigging tables supplied by the assessor. Practice Load Chart and Rigging Exercises are available on our website:

[www.fulford.ca/crane/cs\\_pex.html](http://www.fulford.ca/crane/cs_pex.html).

It is strongly recommended operators complete these practice exercises successfully in advance of the assessment.

Prior to assessment, all operators should read these documents:

- **How to Prepare for the CraneSafe Certification Assessment**
- **WorkSafe Regulations: Wire Rope, Rigging and Attachments**  
Operators should bring this document with them to their assessment to use as a reference.
- **Sample Target Layouts** for the On-Crane Practical portion of the assessment which must be completed with and without load.

### Cancellation Policy

#### Cancellation Fees (per person)

Over 30 days:	\$100.00
10-30 days:	\$225.00
2-9 days:	\$450.00
48 hours or less:	\$750.00

#### Rescheduling Fees (per person)

Over 30 days:	n/a
10-30 days:	\$150.00
2-9 days:	\$375.00
48 hours or less:	\$750.00

## Hoist Lines

### 15.25 Wire Rope Rejection Criteria

Wire rope must be permanently removed from service if

- (a) in running wire ropes, there are 6 or more randomly distributed wires broken in one rope lay or 3 or more wires are broken in one strand in one lay,
- (b) in stationary wire ropes, such as guylines, there are 3 or more broken wires in one lay in sections between end connections, or more than one broken wire within one lay of an end connection,
- (c) wear, or the effects of corrosion, exceed  $\frac{1}{3}$  of the original diameter of outside individual wires,
- (d) there is evidence of kinking, bird-caging or any other damage resulting in distortion of the rope structure,
- (e) there is evidence of heat or arc damage, or
- (f) there are reductions of normal rope diameter, from any cause, in excess of
  - (i) 0.4 mm ( $\frac{1}{64}$  in) for diameters up to and including 8 mm ( $\frac{5}{16}$  in),
  - (ii) 1 mm ( $\frac{3}{64}$  in) for diameters greater than 8 mm ( $\frac{5}{16}$  in) up to and including 19 mm ( $\frac{3}{4}$  in),
  - (iii) 2 mm ( $\frac{1}{16}$  in) for diameters greater than 19 mm ( $\frac{3}{4}$  in) up to and including 29 mm ( $1\frac{1}{8}$  in), or
  - (iv) 3 mm ( $\frac{3}{32}$  in) for diameters greater than 29 mm ( $1\frac{1}{8}$  in).

### 15.26 Non-Rotating Wire Rope

Wire rope with non-rotating construction must be removed from service if

- (a) the rejection criteria in section 15.25 are met,
- (b) there are 2 randomly distributed broken wires in 6 rope diameters, or
- (c) there are 4 randomly distributed broken wires in 30 rope diameters.
- (b) in stationary wire ropes, such as guylines, there are 3 or more broken wires in one lay in sections between end connections, or more than one broken wire within one lay of an end connection,
- (d) there is evidence of kinking, bird-caging or any other damage resulting in distortion of the rope structure,

### 15.15 Wraps Required

At least 2 full wraps of rope must remain on winding drums when the load hook is in the lowest position.

### 15.7 Wire Rope on Mobile Cranes

The minimum design factor based on breaking strength for wire rope on a mobile crane, unless otherwise specified by the crane or wire rope manufacturer, is

- (a) for conventional wire rope
  - (i) 2.5 for pendant lines, 3 for boom hoist reeving and 3.5 for load lines, during erection, and
  - (ii) 3 for pendant lines, 3.5 for boom hoist reeving and 3.5 for load lines, at all times except during erection, and
- (b) 5 for wire rope of non-rotating construction.

## Blocks, Overhaul Balls, Hooks & Sheaves

### 15.17 Sheaves

A sheave must

- (a) be correctly sized for the rope,
- (b) have a device to retain the rope within the groove, and
- (c) be removed from service if it has a damaged groove or flange.

### 15.10 Open Hook Restriction

- (1) A hook must have a safety latch or other means that will retain slings, chains, or other similar parts, under slack conditions.
- (2) A hook used in an application where manipulation of a safety latch or other retaining means may cause a hazard to a worker or where there is no hazard to a worker if the load becomes dislodged is exempt from the requirements of subsection (1).

### 15.29 Hook Rejection Criteria

A worn or damaged hook must be permanently removed from service if:

- (a) the throat opening, measured at the narrowest point, has increased by more than 15% of the original opening,
- (b) the hook has twisted more than  $10^\circ$  from the original plane of the hook,
- (c) the hook has lost 10% or more of its cross-sectional area,
- (d) the hook is cracked or otherwise defective, or
- (e) wear or damage exceeds any criteria specified by the manufacturer.

## Rigging Design Factors

Table 15-1: Minimum design factors for rigging

Component	Min. Design Factor
Nylon fibre rope sling	5
Polyester rope sling	5
Polypropylene rope sling	5
Alloy steel chain sling	4
Wire rope sling	5
Metal mesh sling	5
Synthetic web sling	5
Synthetic roundsling	5
Chain fittings	4
Wire rope sling fittings	5
Other fittings	as specified by manufacturer
Non-rotating wire rope	as specified by manufacturer but not less than 5
Conventional wire rope	5

## 3 Keys of Electrical Safety

### #1 – Look Up & Down

- Plan your work to prevent electrical contact – and call for assistance
- Identify overhead and underground power lines

### #2 – Keep Back – Know Your Limits

- On foot, stay at least 10 metres (33 feet) away from equipment operating around power lines.
- Use a spotter to make sure you keep equipment back at least 6 metres (20 feet) from power lines

### #3 – Stay Back & Call for Help

- Stay back 10 metres (33 feet) from a fallen power line, exposed underground power line or any object in contact with a line.
- If your equipment contacts a line, stay put until help arrives.
- If it's a life threatening situation, jump clear of your vehicle, feet together, and shuffle away keeping both feet close together. Never contact the ground and your vehicle at the same time.
- Call for Help. Do not attempt a rescue until directed by BC Hydro personnel.

## How Electricity Behaves

### Ripple Effect

If anything makes contact with a high voltage power line, such as a tree or an uninsulated boom on a truck, or if a broken power line falls to the ground or lands on a vehicle, electricity will flow to the ground and spread out in concentric circles like the ripples in a pool of water.

Voltage is very high at the point where electricity makes contact with the ground. The level of intensity decreases as the distance increases from the point of contact. Zero voltage is approximately 10 metres (33 feet) from the point of contact.

### Step Potential

Due to the difference in voltage as one moves towards or away from the source of electricity, it is possible to “step” between high and low voltage differences.

As the human body is usually a better conductor of electricity than the ground, the electricity can flow between the feet through the body with sometimes devastating results. This is referred to as “step potential.”

### Touch potential

Trees can be very conductive. If a tree comes into contact with a high voltage power line and a person is touching the tree or touching a ladder leaning against the tree, there will be a high to low voltage difference between the person and the ground.

This will force electrical current to flow through them to the ground and may easily result in serious injury or worse. This is referred to as “touch potential.”

## What to Do in Case of Electrical Contact

### Is there an immediate threat to life or a fire?

- If YES, call 911. They will contact BC Hydro to shut off the power.
- If NO, call 1 888 POWERON (769 3766 or \*49376) to have BC Hydro shut off the power.

### Shuffle or Hop – Don't Step

- If the ground becomes energized while you work, avoid shock by keeping your feet close together and shuffle away – never allowing the heel of one foot to move beyond the toe of the other.
- If you cannot shuffle approximately 10 metres (33 feet) away from the energized area, put your feet together and hop, but never walk.

## Limits of Approach

### Planning to work near energized high-voltage equipment and conductors?

Where work is to be conducted in the vicinity of energized high-voltage electrical conductors, WorkSafe BC regulations specify the safe limits of approach that must be maintained by any worker, work, tool, machine, equipment or material.

VOLTAGE	MINIMUM DISTANCE
Phase to Phase	Metres
Over 750 V to 75 kV	3
Over 75 kV to 250 kV	4.5
Over 250 kV to 550 kV	6

### Plan Before You Start

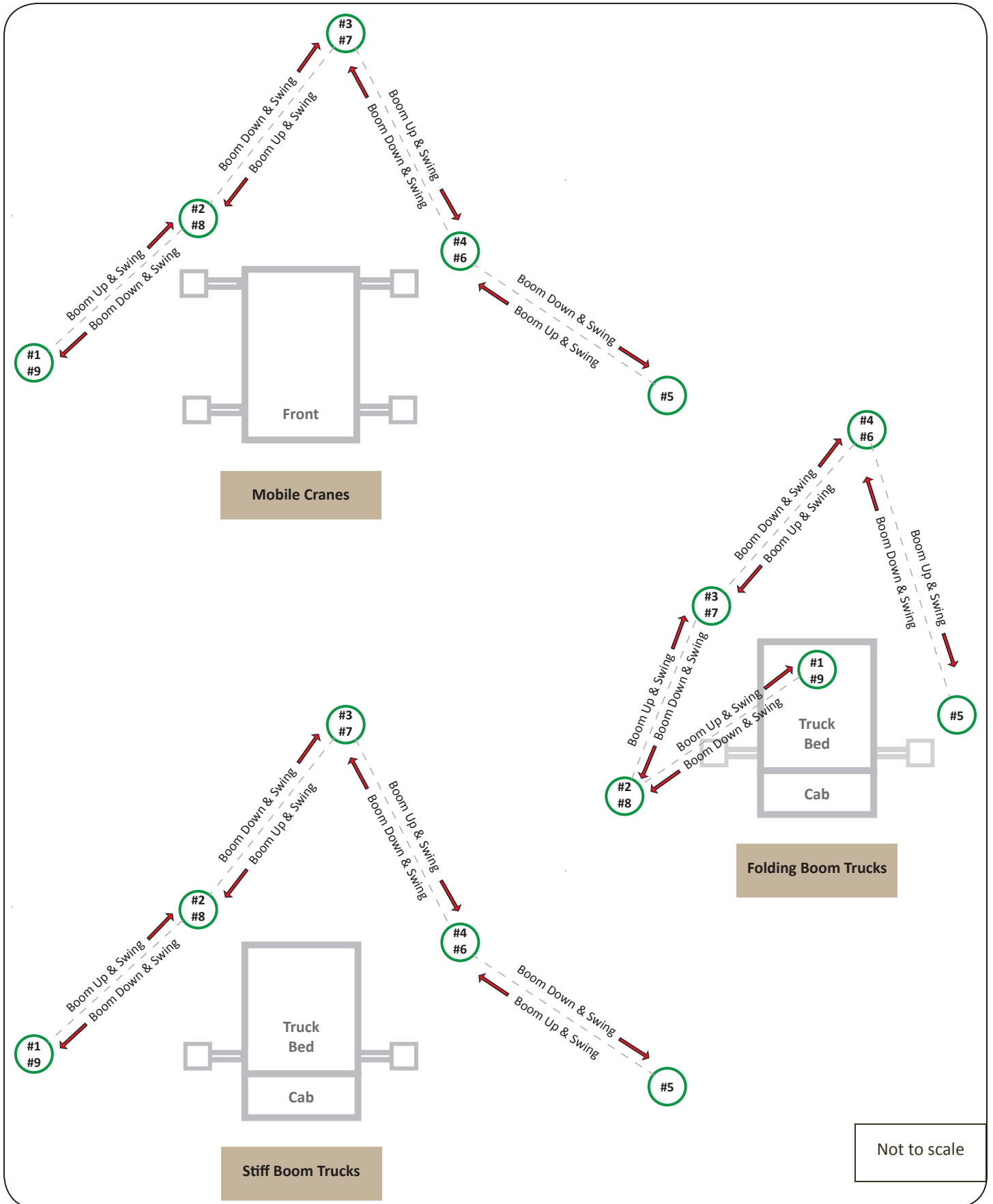
You must notify BC Hydro if your work or equipment, or any inadvertent movement of persons or equipment located outside the limits of approach, could possibly result in encroachment of the limits of approach. BC Hydro will work with you to determine what steps are required to protect you, your workers and the BC Hydro distribution system. If necessary, we will also help you complete WorkSafe BC's 30M33 form.

For more information, contact BC Hydro's Electric Service Coordination Centre at 1 877 520 1355.

### WorkSafeBC 30M33 Form: Assurance in Writing

Form 30M33 is provided to and used by all power system owners in B.C. It is currently the only assurance in writing form that is acceptable to WorkSafeBC.

This form must be completed prior to commencement of work near energized overhead powerlines.



Not to scale

